

## The Knowledge Bank at The Ohio State University

### Ohio Mining Journal

|                                |   |
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**PROCEEDINGS**  
OF THE  
**SEVENTEENTH ANNUAL MEETING**  
OF  
**Ohio Institute of Mining Engineers**  
**JANUARY 19, 20 AND 21, 1898.**

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COLUMBUS, O., Y. M. C. A. Building.

FIRST SESSION — JANUARY 19, 1:30 P. M.

The winter meeting of the Ohio Institute of Mining Engineers for the year 1898, was called to order by President Ray, who presented as the first number of the program, the President's address, as follows:

**SEVENTEENTH ANNUAL MEETING OHIO INSTITUTE  
OF MINING ENGINEERS.**

*Fellow Members of the Institute and Visiting Friends:*

Another year has rolled around and we are again assembled in annual session. It is with pardonable pride and a deep feeling of gratitude to you that I am again allowed, as President to exercise the pleasant privilege of welcoming you to this our seventeenth annual meeting.

You can judge for yourselves from the interesting programme in your possession and the number of members present that we are not lacking in interest or enthusiasm.

In behalf of the Institute and myself I wish to publicly thank these gallant fellow members who are to entertain us at this meeting and contribute to our store of information.

Just seventeen years ago a few men met with the Chief Mine Inspector of Ohio at his office and organized this Ohio Institute of Mining Engineers. The objects being to promote the development of the mineral resources of the state, the eco-

nomical working and ventilating of mines, the improvement of the social status of those engaged in mining, the proper and periodical survey of mines and the preservation of the maps and plans of abandoned mines by means of meetings of the Institute for reading and discussing papers relating to the above subjects and by the publication of such papers in the official organ of the Institute. The constitution was drafted by Andrew Roy and Robert S. Paul with the advice of J. H. Hill, Canton, O., J. Cole, Garrettsville, O., C. H. Burgess, Cleveland, O., L. C. Schnell, Akron, O., A. D. Sheldon, Medina, O., H. F. Ward, Elyria, and R. M. Haseltine of Youngstown, O. The constitution was adopted at the Columbus meeting Jan. 12, 1882, and provides for an annual meeting to be held in Columbus on the Wednesday following the second Tuesday in January at 7 P. M. at the office of the State Inspector of Mines. And for two other meetings annually at such place and time as may be designated by the President. The constitution provides for three annual meetings. From the records I find that seventeen annual meetings have been held in Columbus and that twelve summer meetings have been held, one at each of the following places given in order: Nelsonville, Youngstown, Cleveland, Jackson, Steubenville, Ironton, Logan, Cambridge, Massillon, Corning and an extended excursion to the Kanawha and New River Mining operations, an extended excursion to the Connellsville Coke Region, a joint meeting with the Western Pennsylvania Central Mining Institute at Pittsburg, a joint excursion with them to the coaling stations along the Lakes, with numerous local excursions from each of the above named places.

Our membership in 1883 was forty-seven all told. We have steadily increased this list from year to year until now we can number one hundred and fifty-three members. We once held our meetings in the Mine Inspector's office, now it takes a fair sized hall to hold us.

|                                 |     |
|---------------------------------|-----|
| In 1883 our membership was..... | 47  |
| " 1884 " " " .....              | 56  |
| " 1885 " " " .....              | 69  |
| " 1886 " " " .....              | 91  |
| " 1887 " " " .....              | 98  |
| " 1888 " " " .....              | 73  |
| " 1890 " " " .....              | 63  |
| " 1891 " " " .....              | 116 |
| " 1892 " " " .....              | 119 |
| " 1893 " " " .....              | 123 |
| " 1894 " " " .....              | 133 |
| " 1895 " " " .....              | 128 |
| " 1896 " " " .....              | 130 |
| " 1897 " " " .....              | 153 |

## RECORD OF MEETINGS OF THE INSTITUTE.

ORGANIZED IN COLUMBUS, JANURAY 11, 1881.

| No. of.    | Place of Meeting.       | Excursions to.   | Date of Meeting. | No. of Members. | Years. |
|------------|-------------------------|--|------------------|-----------------|--------|
| 1 Annual.  | Columbus, O.            | .....  | January 12, 1882 | .....           | 1      |
| 2 Annual.  | Nelsonville, O.         | .....  | May 11, 1882     | .....           | 2      |
| 3 Annual.  | Columbus, O.            | Geological Museum, O. S. University                        | January 20, 1883 | 47              | 3      |
| 4 Annual.  | Youngstown, O.          | Leadville shaft and places of interest.                    | May 9, 1883      | 56              | 4      |
| 5 Annual.  | Columbus, O.            | .....  | January 9, 1884  | 69              | 5      |
| 6 Annual.  | Cleveland, O.           | Clev. Rofl. Mill, Brown Hoist Docks, etc.                  | June 25, 1884    | .....           | 6      |
| 7 Annual.  | Columbus, O.            | .....  | January 14, 1885 | .....           | 7      |
| 8 Annual.  | Jackson, O.             | Coal mines along Ohio Southern Ry                          | June 16, 1885    | 91              | 8      |
| 9 Annual.  | Columbus, O.            | Places of interest in vicinity of city                     | January 13, 1886 | .....           | 9      |
| 10 Annual. | Steubenville, O.        | .....  | July 24, 1886    | .....           | 10     |
| 11 Annual. | Columbus, O.            | .....  | January 13, 1887 | .....           | 11     |
| 12 Annual. | Trotton, O.             | .....  | June 28, 1887    | 98              | 12     |
| 13 Annual. | Columbus, O.            | Mines in Hocking Valley                                    | January 12, 1888 | 73              | 13     |
| 14 Annual. | Logan, O.               | .....  | July 11, 1888    | .....           | 14     |
| 15 Annual. | Columbus, O.            | Mines on C. & M. Ry.                                       | January 10, 1889 | .....           | 15     |
| 16 Annual. | Cambridge, O.           | .....  | August 7, 1889   | .....           | 16     |
| 17 Annual. | Columbus, O.            | Places of interest about city.                             | January 23, 1890 | 63              | 17     |
| 18 Annual. | Massillon, O.           | .....  | June 11, 1890    | .....           | 18     |
| 19 Annual. | Columbus, O.            | Excursion to Connellsville Coke Region.                    | January 21, 1891 | 116             | 19     |
| 20 Annual. | .....                   | .....  | June 2, 1891     | 119             | 20     |
| 21 Annual. | Columbus, O.            | Excursion to Connellsville Coke Region.                    | January 25, 1892 | 123             | 21     |
| 22 Annual. | Columbus, O.            | .....  | July 25, 1892    | 133             | 22     |
| 23 Annual. | Columbus, O.            | Excursion to World's Columbian Exposition at Chicago, Ill. | January 19, 1893 | .....           | 23     |
| 24 Annual. | Columbus, O.            | .....  | August 1893      | 133             | 24     |
| 25 Annual. | Columbus, O.            | .....  | January 17, 1894 | 128             | 25     |
| 26 Annual. | Columbus, O.            | Hocking Valley.  | January 21, 1894 | 130             | 26     |
| 27 Annual. | Columbus, O.            | Hocking Valley   | January 21, 1895 | 133             | 27     |
| 28 Annual. | Columbus, O.            | Vicinity of Pittsburgh                                     | January 21, 1896 | 163             | 28     |
| 29 Annual. | Pittsburg—Joint Meeting | .....  | January 20, 1897 | .....           | 29     |
| 30 Annual. | Columbus, O.            | Corning and Shawnee  | June 15, 1897    | .....           | 30     |
| 31 Annual. | Columbus, O.            | Excursion to Sandusky, L.                                  | January 19, 1898 | .....           | 31     |
| 32 Annual. | Columbus, O.            | Corning, Cleveland, Ashtabula, etc                         | .....            | .....           | 32     |
| 33 Annual. | Columbus, O.            | .....  | .....            | .....           | 33     |

University School of Mines

Slim meeting: talk adj'm't

Andrew Roy was elected our first President and held the office until 1885 when Emerson McMillen was elected and served one year. He was succeeded by Hon. R. M. Haseltine who served two years. W. H. Jennings served one year and was followed by W. J. Hestor who served one year. In 1890 Hon. Anthony Howells was elected President and was re-elected three successive years and in 1894 Prof. N. W. Lord was made President serving one year, and followed by Prof. Edward Orton, Jr., who served two years. Your humble servant was elected in 1896 and is serving his second term. The Vice Presidents in order have been: Fred Howell two terms, Ed. Shreeve one term, J. G. Chamberlain one term, W. H. Jennings two terms, R. M. Haseltine one term, Anthony Howells one, Wm. Hanlon one, Henry Price three terms, W. N. Lord and Daniel J. Harry each two terms and J. L. Morris one term.

| Number. | President.          | Vice President.     | Secretary.                             | Treasurer.         | Year. |
|---------|---------------------|---------------------|--|--------------------|-------|
| 1       | Andrew Roy .....    | Fred. Howell. ....  | Robt. S. Paul.....                     | John Ackley. ...   | 1881  |
| 2       | Andrew Roy .....    | Fred. Howell.....   | Robt. S. Paul.....                     | W. H. Jennings..   | 1882  |
| 3       | Andrew Roy. ....    | E. D. Shreeve.....  | E. Orton, jr.....<br>J. A. Hanlon. ... | W. H. Jennings..   | 1883  |
| 4       | E. McMillen . . . . | J. G. Chamberlain.. | R. S. Weitzel.....                     | W. H. Jennings..   | 1884  |
| 5       | R. M. Haseltine.... | W. H. Jennings....  | R. S. Weitzel.....                     | R. S. Weitzel..... | 1885  |
| 6       | R. M. Haseltine.... | W. H. Jennings....  | R. S. Weitzel.....                     | R. S. Weitzel..... | 1886  |
| 7       | W. H. Jennings .... | R. M. Haseltine.... | T. B. Bancroft....                     | T. B. Bancroft.... | 1887  |
| 8       | W. J. Hestor.....   | Anthony Howells..   | T. B. Bancroft....                     | T. B. Bancroft ... | 1888  |
| 9       | Anthony Howells..   | W. B. Hanlon.....   | R. M. Haseltine..                      | R. M. Haseltine..  | 1889  |
| 10      | Anthony Howells..   | Henry Price .....   | R. M. Haseltine..                      | R. M. Haseltine..  | 1890  |
| 11      | Anthony Howells..   | N. W. Lord .....    | R. M. Haseltine..                      | R. M. Haseltine..  | 1891  |
| 12      | Anthony Howells..   | N. W. Lord .....    | R. M. Haseltine..                      | R. M. Haseltine..  | 1892  |
| 13      | N. W. Lord .....    | J. L. Morris....    | R. M. Haseltine..                      | R. M. Haseltine..  | 1893  |
| 14      | Ed. Orton, jr.....  | D. J. Harry.....    | R. M. Haseltine..                      | R. M. Haseltine..  | 1894  |
| 15      | Ed. Orton, jr.....  | D. J. Harry.....    | R. M. Haseltine..                      | R. M. Haseltine..  | 1895  |
| 16      | F. A. Ray.....      | Henry Price.....    | R. M. Haseltine..                      | R. M. Haseltine..  | 1896  |
| 17      | F. A. Ray.....      | Henry Price.....    | R. M. Haseltine..                      | R. M. Haseltine..  | 1897  |

The office of Secretary and Treasurer was united in 1885. R. S. Weitzel and T. B. Bancroft each served two terms. In 1890 Hon. R. M. Haseltine was elected Secretary and Treasurer and has been re-elected each year since. It is to his untiring zeal and energy to a great extent that the Institute owes its present prosperous condition.

During the seventeen years of our history death has claimed and taken from among us fourteen of our honored members whose names are as follows: Thomas Q. Davis, Dr. John S. Newberry, John Nicholson, John Dinkle, Wm. G. Atchinson, John R. Buchtel, Chauncey H. Andrews, Col. Thomas Corcoran, Geo. W. Brashears, Robert Sherard, J. G. Chamberlain, John H. Mullin, John Kane, Thos. West.

The total amount of money received to date is about \$2286.35. This money has been spent in publishing the journal and other legitimate expenses of the Institute. There is due the Institute to date \$286.00 on back dues of the members, \$200 of which is due from old members who have not paid in the past years. \$86.00 is due from members for years '95, '96 and '97. The year 1898 is not included as but few members had paid when these figures were made up.

#### MONEY RECEIVED FROM ALL SOURCES.

|                                     |          |
|-------------------------------------|----------|
| 1881 to 1885, Estimated .....       | \$155 86 |
| 1886, Treasurer's Report.....       | 184 60   |
| 1887, " " .....                     | 174 05   |
| 1888, " " .....                     | 216 40   |
| 1889, " " .....                     | 196 70   |
| 1890 and 1891, Treasurer's Report.. | 487 96   |
| 1892, Treasurer's Report.....       | 171 00   |
| 1893, " " .....                     | 208 50   |
| 1894, " " .....                     | 123 25   |
| 1895, " " .....                     | 289 90   |
| 1896, " " .....                     | 149 25   |
| 1897, " " .....                     | .....    |

Seventy of our members have contributed a total number of 217 papers or addresses since the organization of the Institute. The largest contributors have been Andrew Roy, Dr. Orton, Prof. Lord, R. M. Haseltine, J. L. Morris and Anthony Howells, whose contributions run from seven to twenty-eight each. Seven other members have contributed five papers each and six have contributed four papers each. Five members have each given us three papers. Three members have contributed each two papers while the balance have contributed each on paper. There have also been given eight papers or lectures to the Institute by distinguished men who were not members of our institute.

## LIST OF PAPERS.

| Author of Paper.          | Total. | Number of. | Subject of Paper.  |
|---------------------------|--------|------------|--|
| <i>Andrew Roy.....</i>    |        | 1          | Address First Meeting of Institute.                                  |
|                           |        | 2          | Causes and Wants or Cares of Barren Ground in Ohio Coal Field.       |
|                           |        | 3          | Address Second Meeting.  |
|                           |        | 4          | Mineral Resources of Jackson County.                                 |
|                           |        | 5          | Notes on the Coal Field.   |
|                           |        | 6          | Coal Cutting Machinery in Ohio Mines.                                |
|                           |        | 7          | Ventilation in Coal Mines.   |
|                           |        | 8          | Origin of Coal and Early Mining.                                     |
|                           |        | 9          | Coal Mining in Ohio.   |
|                           |        | 10         | Co-operation.  |
|                           |        | 11         | Characteristics of Miners.   |
|                           |        | 12         | Origin and Results of Miners' Unions.                                |
|                           |        | 13         | The Ohio Coal Field.   |
|                           |        | 14         | The Jackson Shaft Coal and Wellston Coal of Jackson Co.              |
|                           |        | 15         | Glosary of Technical Terms.  |
|                           |        | 16         | On Recent Fire Damp Explosions.                                      |
|                           |        | 17         | Sketch of the Glasgow-Port Washington Works of Tuscarawas Co.        |
|                           |        | 18         | Review of Dr. Orton's Discussion of the Lower Coal Measures of Ohio. |
|                           |        | 19         | The Pocahontas Explosion.  |
|                           |        | 20         | The Identification of Coal Seams.                                    |
|                           |        | 21         | The Peculiarities of Coal Seams.                                     |
|                           |        | 22         | Wearing of Coal Measures.  |
|                           |        | 23         | A Brief History of Mining Legislation in the State of Ohio.          |
|                           |        | 24         | Certificated Mine Inspectors and Mine Bosses.                        |
|                           |        | 25         | The Coal of the Twelve Pole Region of West Virginia.                 |
|                           |        | 26         | Coal Seams of Jackson Co.  |
|                           |        | 27         | The Guyandott West Virginia Coal Fields.                             |
|                           |        | 28         | Protection to Miners.  |
|                           | 29     | 29         | Miners' Hospitals.   |
| <i>Dr. Edward Orton..</i> |        | 1          | Growth and Order of Lower Coal Measures of Ohio.                     |
|                           |        | 2          | The Lower Coal Measures of Ohio.                                     |
|                           |        | 3          | Uses of Ohio Coal.   |
|                           |        | 4          | The Ohio Coal Field.   |
|                           |        | 5          | Iron Ores of Ohio.   |
|                           |        | 6          | The Gas Wells of Ohio.   |

## LIST OF PAPERS—Continued.

| Author of Paper.             | Total. | Number of. | Subject of Paper.  |
|------------------------------|--------|------------|--|
| <i>Dr. Edward Orton.</i>     |        | 7          | Constitution of Ohio Coals.  |
|                              |        | 8          | The Massillon Coal Field.  |
|                              |        | 9          | Salt and Bromide Production in Ohio.   |
|                              |        | 10         | The Trenton Rock and Gas Supply.   |
|                              |        | 11         | The Condition of Oil and Gas Production in Northern Ohio and Indiana.  |
|                              |        | 12         | Origin of the Rock Pressure of Natural Gas Pressure in Trenton Limestone—Ohio and Indiana.   |
|                              |        | 13         | Municipal Corporations and Natural Gas Supply.   |
|                              |        | 14         | Stored Power of the World.   |
|                              |        | 15         | Review of Volume VII., Geological Survey.  |
|                              |        | 16         | The History of a Coal Seam.  |
|                              |        | 17         | The Wastage of Our Coal Fields.  |
|                              |        | 18         | What Geology Owes to the Coal Miner.   |
|                              |        | 19         | Review of the Western Extension of Hocking Valley Coal Field.  |
|                              | 20     | 20         | Natural Gas.   |
| <i>Prof. N. W. Lord. . .</i> |        | 1          | Iron Manufacture of Ohio.  |
|                              |        | 2          | The Hanging Rock Region.   |
|                              |        | 3          | Heat Requirement as Shown by the Composition of Gases in a Furnace Using Ohio Coal Raw.  |
|                              |        | 4          | Education of Mining Engineers.   |
|                              |        | 5          | Department of Mining of the State University and a Short Course in Mining Engineering.   |
|                              |        | 6          | Blast Furnace Tar and Ammonia.   |
|                              |        | 7          | The Chemical Composition of Certain Ohio-Pennsylvania Coals, as Compared with Their Evaporative Performance in Locomotive Boilers. |
|                              |        | 8          | Presidential Address.  |
|                              |        | 9          | Presidential Address.  |
|                              |        | 10         | Heating Power of Various Coal.   |
|                              |        | 11         | Explanations of Calorimeter.   |
|                              | 12     | 12         | School of Mines.   |
| <i>H. C. Lord. . . . .</i>   | 1      | 1          | Lecture on Alaska.   |
| <i>E. P. Lord . . . . .</i>  | 1      | 1          | Compressed Air Locomotive.   |



## LIST OF PAPERS—Continued.

| Author of Paper.            | Total. | Number of. | Subject of Paper.   |
|-----------------------------|--------|------------|---|
| <i>E. D. Haseltine</i> .... | 1      | 1          | Snap Shots Taken in and about the Mines of England and South Wales.             |
|                             | 2      | 2          | Coal Developed along the Line P. & Mc. Ry., 1895.                               |
| <i>Edward Orton, Jr.</i> .. | 1      | 1          | Bedford Cannel Coal.  |
|                             | 2      | 2          | The Technical Education of Clay Workers.  |
|                             | 3      | 3          | State Education and Our Mineral Wealth.   |
|                             | 4      | 4          | Presidential Address.   |
|                             | 5      | 5          | Presidential Address.   |
| <i>Ed. Jones</i> .....      | 1      | 1          | Long Walls Advancing: Its Application to Mines in Ohio.                         |
| <i>R. M. Haseltine</i> .... | 1      | 1          | Development of the Mineral Resources of the Mahoning Valley and Mine Surveying. |
|                             | 2      | 2          | Horse-backs in the Lower Coal Measures and Their Origin.                        |
|                             | 3      | 3          | The Mahoning Coal Field.  |
|                             | 4      | 4          | Presidential Address at Sixth Annual Meeting.                                   |
|                             | 5      | 5          | Presidential Address.   |
|                             | 6      | 6          | Laying Gas Mains.   |
|                             | 7      | 7          | Address Seventh Annual Meeting.   |
|                             | 8      | 8          | Ohio Mineral Supply.  |
|                             | 9      | 9          | Response to Rosemond Address of Oil Committee at Massillon.                     |
|                             | 10     | 10         | Shaw System of Testing Gases.   |
|                             | 11     | 11         | Electricity in Mining.  |
|                             | 12     | 12         | The Wasteful Methods Being Practiced in Mining Coal in the State.               |
|                             | 13     | 13         | Spontaneous Combustion in Mines.  |
|                             | 14     | 14         | Casualties in Coal Mines.   |
| <i>T. F. Smith</i> .....    | 1      | 1          | Gas Ventilation and Explosives.   |
|                             | 2      | 2          | Large Shafts are not Exclusively Beneficial to Mine Ventilation.                |
| <i>Wm. Dalrymple</i> ...    | 1      | 1          | Long Wall Mining.   |
| <i>Charles Pratt</i> .....  | 1      | 1          | Mine Wiring.  |
| <i>W. H. Jennings</i> ....  | 1      | 1          | Exhaustive Mining.  |

## LIST OF PAPERS—Continued.

| Author of Paper.            | Total. | Number of. | Subject of Paper.   |
|-----------------------------|--------|------------|---|
| <i>W. H. Jennings</i> ....  | 2      | 2          | The Complete Results of Weights and Estimates of Coal in the Hocking Valley.                                    |
|                             | 3      | 3          | Presidential Address, July 11, 1898.  |
|                             | 4      | 4          | The Enormous Waste of the Present   |
|                             | 5      | 5          | Method of Mining Coal.  |
| <i>John Stobs</i> ....      | 1      | 1          | Mine Fires and the Mode of Extinguishing Them.  |
| <i>W. C. Pearce</i> .....   | 1      | 1          | The Humane Side of Mining.  |
| <i>E. B. Willard</i> .....  | 1      | 1          | Manufacture of Pig Iron at Hanging Rock.  |
|                             | 2      | 2          | Mining Limestone by Underground Instead of Open Work.   |
|                             | 3      | 3          | The Grouping of the Coal Strata.  |
| <i>John Baillie</i> .....   | 1      | 1          | Mine Furnace Ventilation.   |
| <i>Harry J. Lewis</i> ....  | 1      | 1          | Steel Outside Rigs.   |
| <i>J. G. Chamberlain</i> .. | 1      | 1          | A Tramp's Visit to Southwestern Colorado and Northwestern New Mexico, with Durango as a Starting Point.         |
|                             | 2      | 2          | Social Condition of Our Mining Population Considered.   |
|                             | 3      | 3          | The Iron Industries of Columbiana County.   |
|                             | 4      | 4          | Social Possibilities of the Miner.  |
|                             | 5      | 5          | Our Iron Industries Geographically Considered.  |
|                             | 6      | 6          | Are the Avenues to a Higher Social, Industrial and Political Position Increasing or Diminishing with the Miner? |
| <i>Ellis Lovejoy</i> .....  | 1      | 1          | The Clays of Five Mile Creek.   |
| <i>Thomas Middleton</i> ..  | 1      | 1          | Mine Legislation.   |
|                             | 2      | 2          | Working and Ventilation of the Coal Mine in Pomeroy.  |
|                             | 3      | 3          | The Effect of Mining Out Coal No. 6 Before Taking Out the Seams Above It.                                       |
|                             | 4      | 4          | The Workings and Ventilation of the Monongahela Coal Mines of Marion County, West Virginia.                     |
|                             | 5      | 5          | Mine Ventilation.   |

## LIST OF PAPERS—Continued.

| Author of Paper.               | Total. | Number of. | Subject of Paper.   |
|--------------------------------|--------|------------|---|
| <i>J. C. H. Cobb</i> . . . .   | 1      | 1          | The Hanging Rock District.  |
| <i>John E. Short</i> . . . .   | 1      | 1          | Things I Witnessed While District Mine Inspector.                               |
| <i>Wm. Smurthwaite</i> . . . . |        | 1          | Coal Mining at Steubenville.  |
|                                |        | 2          | Our Mineral Resources and Their Economical Development.                         |
|                                |        | 3          | Sketch of the Development of the Steubenville Shaft Mines.                      |
|                                | 4      | 4          | The Perils of Mining.   |
| <i>P. F. Schmidt</i> . . . .   | 1      | 1          | The Difference Between Mining Coal and Iron Ores.                               |
| <i>A. D. Selby</i> . . . . .   | 1      | 1          | Notes on the Barren Measures.   |
| <i>J. A. Ede</i> . . . . .     |        | 1          | The Ores of Virginia.   |
|                                |        | 2          | Development of No. 3 or Wellston Coal.  |
|                                | 3      | 3          | Coal Fields of Jackson County.  |
| <i>R. S. Paul</i> . . . . .    | 1      | 1          | Mine Engineering Practice.  |
| <i>H. V. Van Atta</i> . . . .  | 1      | 1          | Preservation of Survey Lines and Points in Mines.                               |
| <i>Fred. Howell</i> . . . . .  | 1      | 1          | Tin Plate Making.   |
| <i>T. L. Watkins</i> . . . .   | 1      | 1          | Coals of Vinton County.   |
| <i>J. L. Morris</i> . . . . .  |        | 1          | Underground Haulage.  |
|                                |        | 2          | The Means of Applying Power or Pressure to Provide Ventilation.                 |
|                                |        | 3          | Early Mining of Coal.   |
|                                |        | 4          | School of Mines.  |
|                                |        | 5          | The Black Band Ore Field of Post Boy, Tuscarawas County.                        |
|                                |        | 6          | Fatal Explosions of Mines of England and Wales during Last Half of the Century. |
|                                |        | 7          | The Original Members of the Institute.  |
|                                |        | 8          | Poetry.   |
|                                |        | 9          | Explosives.   |
|                                |        | 10         | What I Saw in the Coke Region.  |
|                                |        | 11         | What I Saw in the Connellsville Region.   |

## LIST OF PAPERS—Continued.

| Author of Paper.               | Total. | Number of. | Subject of Paper.  |
|--------------------------------|--------|------------|--|
| <i>J. L. Morsis</i> . . . . .  | 12     | 12         | What I Saw in South Wales and England.   |
| <i>Joseph W. Blower</i> . .    | 1      | 1          | Method of Working the Pittsburg Seam.  |
| <i>Wm. E. Clifford</i> . . .   | 1      | 1          | Fan vs. Furnace Ventilation.   |
| <i>F. W. Fowler</i> . . . . .  | 1      | 1          | Jumbo Auger.   |
| <i>F. W. Sperr</i> . . . . .   | 1      | 1          | Split Air Courses vs. Continuous Currents.   |
|                                | 2      | 2          | Sewerage, Drainage and Water Supply.   |
|                                | 3      | 3          | The Coefficient of Friction in Mine Air Courses and the Calculation of Centrifugal Fans. |
| <i>C. V. Martin</i> . . . . .  | 1      | 1          | Mine Maps.   |
| <i>C. R. Thomas</i> . . . . .  | 1      | 1          | Adaptation of Multiphase Alternating Current Transmission to Mining Apparatus.           |
| <i>Thomas H. Love</i> . . .    | 1      | 1          | Practical System of Mining in Ohio.  |
| <i>Wm. B. Rennie</i> . . . .   | 1      | 1          | Miners' Sunshine and Its Uses.   |
| <i>W. B. Brooks</i> . . . . .  | 1      | 1          | Some Experiments in Blasting.  |
| <i>C. W. Jenks</i> . . . . .   | 1      | 1          | Electricity in Mining.   |
| <i>Fred. C. Keighley</i> . .   | 1      | 1          | Expense with Mines That Generate Fire Damp in the Connellsville Coke Region.             |
|                                | 2      | 2          | The Certificated Mine Boss.  |
|                                | 3      | 3          | Theoretical and Practical Mining.  |
| <i>Thos. West</i> . . . . .    | 1      | 1          | Long Wall Mining and Its Merits.   |
| <i>F. A. Ray</i> . . . . .     | 1      | 1          | Congo Mine and Equipment.  |
|                                | 2      | 2          | Mine Surveying.  |
|                                | 3      | 3          | Address at Pittsburg.  |
|                                | 4      | 4          | Paper on Idaho Silver Mines.   |
|                                | 5      | 5          | Address at Columbus.   |
| <i>Cyrus Robinson</i> . . .    | 1      | 1          | Economics in Coal Production.  |
| <i>John P. Jones</i> . . . . . | 1      | 1          | Spontaneous Combustion.  |

## LIST OF PAPERS—Continued.

| Author of Paper.            | Total. | Number of. | Subject of Paper.  |
|-----------------------------|--------|------------|--|
| <i>J. S. Newberry</i> ....  | 1      | 1          | Physical Condition Under Which Coal Was Formed.                      |
| <i>W. M. Schlessinger</i> . | 1      | 1          | The Advantages of Electricity for Mining Purposes.                   |
| <i>W. B. Hanlon</i> ....    |        | 1          | Progress of Coal Handling Machinery.                                 |
|                             |        | 2          | Notes on the Wastage of Coal.  |
|                             | 3      | 3          | Dock Machinery.  |
| <i>Charles Whittlesey</i> . |        | 1          | Discovery of Coal in Ohio and Early Mine Work.                       |
|                             |        | 2          | The Lower Limestone Group Coal Series of Northwestern Ohio.          |
|                             |        | 3          | Ohio Surveys.  |
|                             | 4      | 4          | First Blast Furnaces in America.                                     |
| <i>J. W. Haughee</i> ....   |        | 1          | The Dog Mines of Muskingum County.                                   |
|                             |        | 2          | The Necessity of Making Break Through Even and Uniform at the Mines. |
|                             |        | 3          | A Standard Grade of Powder Necessary for Use in the Mines.           |
| <i>T. E. Hughes</i> .....   | 1      | 1          | Wire Rope Haulage.   |
| <i>A. M. Killop</i> ... ..  | 1      | 1          | Metals and Their Properties.   |
| <i>J. L. Mitchell</i> ..... |        | 1          | Hauling, Dumping and Screening Coal.                                 |
|                             | 2      | 2          | Economy in the Use of Compressed Air.                                |
| <i>Roger Ashton</i> .....   | 1      | 1          | Mine Accidents.  |
| <i>R. S. Weitzel</i> . ...  |        | 1          | Discussion of Mine Maps.   |
|                             |        | 2          | Mineral Land and Mine Surveying.                                     |
|                             |        | 3          | Map Construction.  |
|                             | 4      | 4          | Coal Fields of Texas.  |
| <i>John H. Mullin</i> ....  | 1      | 1          | The Advantages in the Use of the Diamond Drill.                      |
| <i>T. H. Love</i> .....     |        | 1          | Oils Used in Our Mines.  |
|                             |        | 2          | Practical Mining.  |
|                             | 3      | 3          | Some Hints About Mining Coal.  |
| <i>William Hibbs</i> .....  |        | 1          | Management of Men.   |

## LIST OF PAPERS—Concluded.

| Author of Paper.            | Total. | Number of.                      | Subject of Paper.  |
|-----------------------------|--------|---------------------------------|--|
| <i>William Hibbs.....</i>   | 5      | 2<br>3<br>4<br>5                | Mine Surveying.<br>The Mine Foreman and His Duties.<br>Explosive Character of the Blanchester Mine and Colliers, West Virginia.<br>Practice Compared with Theory in Coal Mining.   |
| <i>Emerson McMillen.</i>    | 5      | 1<br>2<br>3<br>4<br>5           | The Gas Coals of Ohio.<br>Natural Gas.<br>Iron Ores of Ohio and Their Treatment.<br>Gas Fuel.<br>How Can the Bituminous Slack of Our Coal Mines Be Utilized?   |
| <i>Anthony Howells ..</i>   | 7      | 1<br>2<br>3<br>4<br>5<br>6<br>7 | Review of A. Roy's Discussion of Dr. Orton's Discussion of the No. 1 or Sharon Coal Seam.<br>Review of William Dalrymple's Paper on Long Wall Mining.<br>Presidential Address.<br>Presidential Address at Massillon, O.<br>Presidential Address.<br>Presidential Address.<br>Spring Pole Drilling. |
| <i>Thos. B. Bancroft...</i> | 4      | 1<br>2<br>3<br>4                | Strikes in the Ohio Coal Fields.<br>Coke Manufactures in Ohio.<br>Recent Coal Developments.<br>Fan Ventilation.  |
| <i>James P. Davis ....</i>  | 1      | 1                               | Extravagant Mining.  |
| <i>Henry Price.....</i>     | 1      | 1                               | Iron Industries.   |
| <i>Fred. W. Gordon...</i>   | 1      | 1                               | Coking and Coke from Ohio Coals.   |
| <i>John J. Dun.....</i>     | 1      | 1                               | Machine Mining.  |
| <i>B. Wheeler .....</i>     | 1      | 1                               | Clays and Coals of Muskingum County.   |
| <i>John Kane.....</i>       | 1      | 1                               | The Mine Boss and His Relations to the Operator and Miner.   |

LIST SHOWING THE NUMBER OF PAPERS CONTRIBUTED BY  
MEMBERS OF THE INSTITUTE.

| Names of Authors.         | Number of Papers<br>Contributed. | Names of Authors.                                   | Number of Papers<br>Contributed. |
|---------------------------|----------------------------------|---|----------------------------------|
| Andrew Roy.....           | 28                               | Prof. F. W. Sperr.....                              | 3                                |
| Dr. Edward Orton.....     | 21                               | C. V. Martin.....                                   | 1                                |
| Prof. N. W. Lord.....     | 12                               | C. R. Thomas.....                                   | 1                                |
| Hon. R. M. Haseltine..... | 14                               | Thomas H. Love.....                                 | 4                                |
| Capt. J. L. Morris.....   | 12                               | Wm. B. Rennie.....                                  | 1                                |
| Edward Orton, Jr.....     | 5                                | W. B. Brooks.....                                   | 1                                |
| W. H. Jennings.....       | 5                                | C. W. Jenks.....                                    | 1                                |
| E. D. Haseltine.....      | 2                                | Frederick Keighley.....                             | 4                                |
| E. B. Willard.....        | 3                                | Thomas West.....                                    | 1                                |
| Samuel Llewellyn.....     | 1                                | F. A. Ray.....                                      | 5                                |
| John Baillie.....         | 1                                | Cyrus Robinson.....                                 | 1                                |
| Ed. Jones.....            | 1                                | John P. Jones.....                                  | 1                                |
| T. F. Smith.....          | 2                                | J. S. Newberry.....                                 | 1                                |
| William Dalrymple.....    | 1                                | Wm. M. Schlessinger.....                            | 1                                |
| Charles Pratt.....        | 1                                | W. B. Hanlon.....                                   | 3                                |
| John Stobs.....           | 1                                | Charles Whittlesey.....                             | 4                                |
| W. C. Pearce.....         | 1                                | J. W. Haughee.....                                  | 3                                |
| H. C. Lord.....           | 1                                | T. E. Hughes.....                                   | 1                                |
| E. P. Lord.....           | 1                                | A. M. Killop.....                                   | 1                                |
| J. G. Chamberlain.....    | 5                                | J. L. Mitchell.....                                 | 2                                |
| Harry Lewis.....          | 1                                | Roger Ashton.....                                   | 1                                |
| Ellis Lovejoy.....        | 1                                | R. S. Weitzel.....                                  | 4                                |
| Thomas Middleton.....     | 5                                | John H. Mullin.....                                 | 1                                |
| J. C. H. Cobb.....        | 1                                | William Hibbs.....                                  | 5                                |
| John E. Short.....        | 1                                | Emerson McMillen.....                               | 5                                |
| William Smurthwaite.....  | 4                                | T. B. Bancroft.....                                 | 4                                |
| P. F. Schmidt.....        | 1                                | Anthony Howells.....                                | 7                                |
| A. D. Selby.....          | 1                                | John Kane.....                                      | 1                                |
| J. A. Ede.....            | 3                                | J. P. Davis.....                                    | 1                                |
| R. S. Paul.....           | 1                                | Henry Price.....                                    | 1                                |
| H. B. Van Atta.....       | 1                                | F. W. Gordon.....                                   | 1                                |
| William Phillips.....     | 1                                | J. J. Dun.....                                      | 1                                |
| Fred Howell.....          | 1                                | B. Wheeler.....                                     | 1                                |
| T. L. Watkins.....        | 1                                |   |                                  |
| Joseph W. Blower.....     | 1                                |   |                                  |
| Wm. E. Clifford.....      | 1                                |   |                                  |
| F. W. Fowler.....         | 1                                |   |                                  |
|                           |                                  | Total number papers con-<br>tributed by members.... | 217                              |

LIST OF MEMBERS WHO HAVE NOT CONTRIBUTED ANY  
PAPERS TO THE INSTITUTE.

|  |  |  |
|--|--|--|
| William Job,<br>Zachariah Tetlow,<br>John C. Allen,<br>L. V. Brown,<br>H. L. Chapman,<br>M. L. Sternberger,<br>Thos. E. Knauss,<br>W. H. Gaffney,<br>P. H. Doyle,<br>A. J. Norton,<br>R. B. Collier,<br>Jas. R. Birbeck,<br>Robt. Thompson,<br>J. F. Roberts,<br>C. N. Brown,<br>W. F. Upson,<br>A. J. Baggs,<br>E. L. Jones,<br>Geo. Atherton,<br>Matthew English,<br>Evan J. Evans,<br>R. R. Watt,<br>Jas. Moss,<br>Ebenezer Lewis,<br>J. H. Burt,<br>William James, | J. E. English,<br>John Cassingham,<br>Wm. H. Turner,<br>S. T. Croyle,<br>Chalkley Dawson,<br>Adam McDonald,<br>H. V. Carl,<br>David Davis,<br>O. V. Dibble,<br>F. N. Barnes,<br>L. E. Bryant,<br>Lucien S. Johnson,<br>W. C. Gayhart,<br>Robt. H. Miller,<br>Alexander Beattie,<br>E. J. Huston,<br>H. M. Morriston,<br>D. N. Osyor,<br>G. W. Greenwood,<br>Richard Prosser,<br>Henry Moss,<br>David M. Wise,<br>Geo. Rowland,<br>D. P. Lewis,<br>G. W. Davis,<br>David Ritchie, | W. B. Montgomery,<br>Geo. Carding,<br>C. E. Holden,<br>J. A. Beidler,<br>C. J. Brookenshire,<br>C. G. Newton,<br>L. D. Lampman,<br>Alexander Palmros,<br>Frank Brown,<br>S. M. Taylor,<br>G. W. Schlenderberg,<br>J. C. Millinger,<br>E. A. Hitchcock,<br>J. K. Geddes,<br>E. D. Kelley,<br>W. A. Woodworth,<br>Henry Laviers,<br>C. F. Smith,<br>Thos. McGough,<br>Reese T. Davis,<br>Joseph Collier,<br>Hugh Mallen,<br>J. L. Wagner,<br>Victor Gutz,<br>Edward Johnson,<br>Fred. Miller.—78 |
|--|--|--|

|   |    |
|---|----|
| Total number of members who have not contributed papers to the<br>Institute .....   | 78 |
| Total number of members who have contributed (217) papers to the<br>Institute ..... | 70 |
| Excursions taken by the Institute .....   | 15 |

This is quite a creditable showing. On the other hand we have seventy-eight members who have not contributed a single paper to the meetings of the Institute. I hope that this list may be wiped out within the next few years. We know the men whose names appear in this list are men of good ability and can give us instruction and interesting papers. We therefore urge upon them to come forward and contribute towards the good work the Institute is doing. We know we now have your good will and influence but we want and must have more than that—we want and need some of your work.

At the time of the organization of the Ohio Institute of Mining Engineers the Trade Review of Cleveland was adopted



as the official organ of the Institute. This arrangement was not satisfactory and in Sept. 1882 the Institute resolved: That the Trade Review of Cleveland be no longer regarded as the official organ of the Institute of Mining Engineers and that this Institute publish a quarterly journal to be known as the Ohio Mining Journal which Journal is to be the property and the official organ of this Institute, to be published in Columbus, O. The numbers of said Journal to be issued quarterly and to be furnished free to all members of the Institute and to subscribers at \$2 per annum in advance. Single copies 50c. Hann & Adair of Columbus, O., published the Journal until 1885. Then the funds became so low that many thought it best to discontinue the publication of the Journal but after a lengthy discussion it was recommended: To publish the Mining Journal at least every six months, immediately after the meeting of the Institute and that the executive committee be empowered to issue said Journal oftener if material is furnished for publication and the same can be done without further expense to the Institute. C. V. Martin of Zanesville then published the Journal at 60c. a year until Aug. 1885 when the institute resumed the publication at the same price. In 1887 the price was raised to \$1.00 per annum and the Journal published by the Argus Printing Co. of Wellston, O., who proposed to publish the Journal at no expense to the Institute and make it the official organ of the Institute. No Journal was issued from Aug. 1887 until June 1888. Then it was again published in Columbus and two Journals issued in 1888 one in 1889, one in 1890. President Howells in his annual speech of 1891 suggested "that more Journals be published and distributed to miners at 25c. a copy." Also "that the President should always have his picture in the Mining Journal. The Journal was published in 1892 containing the proceedings of the winter and summer meetings. A resolution was passed in this year authorizing the placing of the Journals on sale in the various mining centers throughout the state. This plan was not successful.

The 21st number of the Ohio Mining Journal was ready for publication shortly after the summer excursion in 1893 but its issue was delayed for lack of funds, it was compiled and published by Mr. Haseltine. Volumes 22 and 23 are published together and contain the proceedings of the years 1893 and 1894. Since then no Journal has been published for lack of funds and the problem of distributing the Journal to do the greatest good to the greatest number is still unsolved. It is very unfortunate that this is the case. If every member would pay his dues promptly there would be no difficulty about publishing the Jour-

nal on time. As it is our Secretary has the material ready for three Journals and not money enough in the treasury to publish one of them. At the same time there is due the Institute \$286.00 which if paid would be all that is necessary for immediate demands. In order that we may realize all the benefits from the Institute that it is capable of giving us, it is necessary that our proceedings should be published promptly. In this age of rapid progress and lightning changes engineering matter three years old is often ancient and out of date and worthless. I therefore urge you to take up this matter of publishing the Journal for consideration and see if some way or means cannot be devised by which we can secure the prompt publication of our proceedings and place them in the hands of our members in time to be of full value to them. I would suggest to limit the publication of extemporaneous discussion and only the prepared discussions to be published in full.

It is a great satisfaction to know that our Institute has always maintained a leading position in all matters relating to the improvement of the mining industry of Ohio. The following resolutions from records, passed at various meetings of the Institute since her founding will speak for themselves of the important movements to which she has given her influence. At the January meeting 1882 the Institute Resolved: That all the mines in the State whether of coal, iron ore, fire clay, or other material, should be included under the Mines Inspector Act, in accordance with the recommendations contained in the late message of the Governor to the General Assembly. Resolved: That the recommendations of the Governor as contained in his late annual message to the late General Assembly, that all mining bosses should be required to pass a satisfactory examination before an examining board and receive certificates of competency, should be enacted into a law.

Resolved: That section 296 of the Revised Statutes should have a suitable penalty attached, to secure the better enforcement of the mining law regarding the surveying and mapping of mines and in all cases of mines being abandoned or closed that maps or plans of such mines should be preserved and recorded in some suitable place for reference in future times and that neglect or refusal on the part of mine owners to furnish maps for preservation and record should render the offender liable to some penalty.

Jan. 1887 Resolved: That the department of mining and metallurgy in the State University requires more liberal appropriations from the General Assembly to carry out the letter and spirit of the law creating the school of mines.

Resolved: That a committee of three be appointed by the President to visit the department of mining and metallurgy to examine and inquire into the wants and necessities of the same and that said committee report the facts to this Institute at the January meeting to be held in Columbus.

June 15, 1888 Resolved: That in the sense of the Ohio Institute of Mining Engineers, the Mining Engineers of the State must be subserved by representation on the Board of Trustees of the O. S. U.

In 1889 the subject of State Hospitals was agitated.

November 1890 Resolved: That we endorse the appliance known as the Shaw Machine and recommend its introduction to and use in all the mines.

Jan. 1891 Resolved: That in the opinion of the Ohio Institute of Mining Engineers a uniform system of time is highly desirable and that they recommend the adoption of standard time all over the State of Ohio and urge any legislative action which will conduce to that result.

1891 Resolved: That it is the desire of the Ohio Institute of Mining Engineers that the Legislature should pass a bill of the following effect. Regarding the competency of Mine Bosses and Mine Inspectors.

In 1894 action was taken which resulted in the establishment of the School of Ceramics in the State University.

Jan. 1896 Resolved: That a committee be appointed by the President of the Institute from among its members or others representing the different mining interests of the State, which shall appear before the Legislature and request that a committee be appointed by the Legislature to investigate the matter of wasteful mining of coal in this state, said committee to be named and members be notified of their appointment thirty days after the adjournment of this meeting. Your President appointed W. H. Jennings, Wm. Smithwait, H. D. Marble, W. H. Turner, W. F. Upson, Dr. Edward Orton, H. L. Chapman, W. B. Hanlon, Ed. Orton, Jr., and T. H. Love. After some correspondence the committee was called together and met with the committees on Mining and Geology of the House and Senate which resulted in the introduction of H.J. R. No. 37 by Mr. Van Pelt: That the Governor appoint a commission of three persons to investigate the variable waste of coal etc. With special reference to the reduction and abatement of the same. The commissioners were to serve without pay but an appropriation of \$2500 for the expenses and printing was asked for. When the bill came up for passage Mr. Van Pelt was ill and absent. It was a night session and on account of the poor attendance the bill was lost,

The committee decided to carry on the investigation through the Institute by correspondence with the members individually. From lack of interest that so many members showed in their replies to communications from the committee, this method did not yield very fruitful results. However chairman Jennings read a paper at Pittsburg relating to the action of the Institute on waste coal and the work of the committee interested the Western Pennsylvania Central Institute so much that they took a similar action for Pennsylvania. What they have accomplished since then I am unable to say. At our last annual meeting your committee made a report and asked to be discharged. The Institute accepted the report and continued the committee, the object being to keep the committee alive so that they, reinforced by this experience with the last General Assembly, may go before the present one with better chance of securing the desired legislation. I urge the Institute to continue this same committee with instructions to renew their efforts to secure the passage of the Van Pelt Bill before referred to. If unnecessary wasteful mining is practiced in Ohio, it should be made known and the necessary legislative action taken to control or prevent it. We should now act in this matter or in the future stop talking about it. In my address last year I endeavored to make clear my position concerning the voidable wastage of coal. I believe there is an unnecessary wastage of coal going on that could in a measure be stopped and I believe the most rational way to reach it is through education by requiring systematic surveys and accurate maps and by certificating mine bosses, mine superintendents and mine surveyors. Also enlarging the duties and power of the chief Mine Inspector. The coal field of Ohio should be mapped by townships with the mines accurately delineated thereon, to the scale of 400 ft. to the inch and these maps reduced photographically and published each year in the Mine Inspector's report. The chief Inspector should make a chapter of this report on mine maps and surveys, which would show up what companies in Ohio employed mining engineers and which ones did not. The periods between surveys and the relative condition of the mines under these different conditions of surveys. This would bring out some valuable information and it would tend to improve the maps and surveys and the condition of the mines. Because each mine owner and each engineer from professional pride if for no other reason would endeavor to have his work in good enough shape as to get a good report of the same from the State Mining Department.

In conclusion I wish to say that I am proud of the record the Institute has made in the seventeen years of her existence

and I hope that her future will be as fruitful of good results as her past has been.

PRESIDENT RAY: The points which I have endeavored to bring out in my address in reference to the history of the society would more properly come up under the head of miscellaneous business. One suggestion which I wish to emphasize is for the members to write more papers; the second, is for the members to pay their dues; the third one is the matter of publication of the Journal, and the fourth, in relation to the committee on wastage of coal. The discussion of these matters will come up under the head of miscellaneous business, if you see fit to take it up then. I see we have Mr. Paul here, one of the founders of this Institute, perhaps he will have something to say.

MR. PAUL: Fellow members, it seems a good while ago when we organized this institute, and as I listened to the President's paper, I learned that much which we tried to accomplish, you are still endeavoring to accomplish. I will not take up any time in reminiscences, but will simply state that the president has outlined the work to be done in a very good manner for us. If we take too large a field, we are apt not to cover as much. In regard to the point of wastage of coal, there are several views to take of that and I prefer not to say anything until that subject comes up for general discussion.

PRESIDENT RAY: If there are no other speakers now, we will pass to the report of the Secretary-Treasurer.

SECRETARY HASELTINE: The President's report carried me back so many years, that I became lost in reminiscences.